PUBLIC (REDACTED) VERSION

BEFORE
THE PUBLIC SERVICE COMMISSION OF
SOUTH CAROLINA

DOCKET NO. 2020-263-E

Cherokee County Cogeneration Partners, LLC Complainant/Petitioner, v. Duke Energy Progress, LLC and Duke Energy Carolinas, LLC, Defendants/Respondents.	)	**DIRECT TESTIMONY OF JOHN FREUND ON BEHALF OF DUKE ENERGY CAROLINAS, LLC AND DUKE ENERGY PROGRESS, LLC**

I. INTRODUCTION AND PURPOSE

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is John Freund. My business address is 526 South Church Street, Charlotte, North Carolina.

Q. BY WHOM ARE YOU EMPLOYED AND IN WHAT CAPACITY?

A. I am currently employed by Duke Energy as a Senior Structuring Analyst.

Q. PLEASE DESCRIBE YOUR CURRENT RESPONSIBILITIES IN YOUR POSITION WITH DUKE ENERGY.

A. My current responsibilities as a Senior Structuring Analyst focus on avoided cost methodology, rate design/pricing/support related to purchased power for large qualifying facilities ("QFs"), as well as developing economic analysis and methodology support for Duke Energy Carolinas, LLC's ("DEC") and Duke Energy Progress, LLC's ("DEP" and, together with DEC, the "Companies") avoided cost calculations.

Q. PLEASE BRIEFLY SUMMARIZE YOUR EDUCATIONAL AND PROFESSIONAL EXPERIENCE.

A. I started with Duke Power in 1977, initially with the Rate Department, and eventually serving in other areas such as the System Planning & Operating organization, Bulk Power Marketing, and currently the Wholesale & Renewables Analytics area. My responsibilities have included retail rate design, pricing and cost support for wholesale transactions, analysis of bids related to generation capacity-related requests for proposals, risk management system support, mid to long-term wholesale rate design & pricing, and economic analysis training and support. I hold a Bachelors degree in economics from Pfeiffer University, and a Masters degree in economics from N.C. State University.

Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE THE PUBLIC SERVICE COMMISSION OF SOUTH CAROLINA?

A. Yes. I testified on behalf of Duke Power before the Commission on several occasions during the 1980s and early 1990s regarding avoided costs and standard-offer QF pricing under the Public Utility Regulatory Policies Act of 1978 ("PURPA").

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS PROCEEDING?

A. In my testimony, I respond to the testimonies of Cherokee County Cogeneration Partners, LLC ("Cherokee") Witnesses Hanson and Strunk, and discuss how the Companies calculated the avoided cost rates that were provided to Cherokee during the 2018-2020 time period. I show that all of these rates were calculated in a manner that was consistent with the methodology approved by the Commission and with the methodology used to calculate rates for other large QFs requesting to sell to the Companies under PURPA at DEC's or DEP's avoided costs. I also address Witness Strunk's rate recommendation and explain why his calculated rate is inappropriate and significantly exceeds DEC's actual avoided costs, even if the Commission were to find that Cherokee established a legally enforceable obligation ("LEO") in 2018.

II. CALCULATION OF AVOIDED COST RATES FOR CHEROKEE IN 2018-2021

Q. HOW MANY TIMES DID THE COMPANIES CALCULATE AVOIDED COST RATES FOR CHEROKEE DURING THE 2018-2021 TIME PERIOD?

A. The Companies calculated avoided cost rates for Cherokee five times during this time period – in October 2018, January 2019, June 2020, September 2020, and February 2021. DEC/DEP Witness Michael Keen provides additional discussion about the communications between the Companies and Cherokee during this time frame in his testimony.

Q. WERE YOU INVOLVED WITH THE CALCULATION OF EACH OF THE RATES PROVIDED TO CHEROKEE DURING THIS TIME PERIOD?

A. Yes, either by calculating the rates myself or reviewing the rates calculated by others on my team.

Q. CAN YOU PROVIDE SOME DETAIL ABOUT THE RATES PROVIDED TO CHEROKEE IN EACH OF THESE INSTANCES?

A. Yes. The following Figure 1 presents the key attributes of each rate provided to Cherokee during the 2018-2021 time period. I discuss the details presented in Figure 1 further below.

Freund Direct Figure 1:
Five Avoided Cost Rate Proposals Provided to Cherokee

	DEC Oct. 2018	DEP Feb. 2019	DEP Jun. 2020	DEC Sept. 2020	DEC Feb. 2021
Date of rate request	9/17/18	12/12/18	5/4/20	9/17/20[1]	n/a[2]
Date rate provided	10/31/18	2/1/19	6/24/20	9/17/20[3]	2/10/21
PPA structure	Non-dispatchable	Non-dispatchable	Non-dispatchable	Dispatchable tolling	Dispatchable tolling
IRP used to support first year of capacity need	2018 IRP (DEC)	2018 IRP (DEP)	2019 IRP (DEP)	2020 IRP (DEC)	2020 IRP (DEC)
First year of capacity need based on IRP	2028	2020	2020	2026	2026
Timing of gas cost assumptions	September 2018	December 2018	April 2020	April 2020	August 2020
Term	5 years	5 years	5 years	10 years	10 years

Q. DID CHEROKEE'S WITNESSES MENTION THE DISPATCHABLE TOLLING AVOIDED COST RATES THAT DEC PROVIDED IN SEPTEMBER 2020 AND FEBRUARY 2021 IN THEIR TESTIMONY?

A. No, they did not. I am providing information regarding all of the rates provided to Cherokee in order to demonstrate that the Companies consistently abided by their standard process and general methodology for calculating avoided cost rates for large QFs.

[1] Occurred during the 9/17/20 telephone conversation between Cherokee Witness Hanson and DEC/DEP Witness Keen.

[2] As discussed by Witness Keen, the rates provided by DEC to Cherokee in February 2021 represented DEC's effort in anticipation of the February 2021 mitigation to reach agreement with Cherokee.

[3] Occurred during the 9/17/20 telephone conversation between Cherokee Witness Hanson and DEC/DEP Witness Keen.

Q. WHAT INFORMATION DOES YOUR FIGURE 1 PRESENT?

A. For each set of rates provided to Cherokee over the last three years, the chart identifies whether the relevant utility was DEC or DEP, the date of Cherokee's request for rates (if applicable), the date of the DEC/DEP response, the structure of the purchased power agreement ("PPA") (non-dispatchable or dispatchable tolling), the first year of capacity need, the applicable integrated resource plan ("IRP") supporting that identified need, the gas cost assumption timing, and the term of PPA provided to Cherokee.

Q. WHAT DOES THIS INFORMATION SHOW ABOUT THE AVOIDED COST RATES PROVIDED TO CHEROKEE?

A. This information shows that both of the Companies responded multiple times to Cherokee's requests for avoided cost rates. This history also demonstrates that each rate, regardless of whether it reflected a dispatchable-tolling or a non-dispatchable PPA, was based on then-current inputs in a manner that was fundamentally consistent with the Commission's directives to the Companies in its recent avoided cost proceeding and with the approach used by the Companies to calculate avoided cost rates for large QFs.

Q. PLEASE EXPLAIN.

A. Prior to the 2019 avoided cost proceeding, the Commission directed that all rates for QFs above 2 megawatts ("MW"), or that are otherwise ineligible for the standard tariffs, be negotiated under PURPA and the Federal Energy Regulatory Commission's ("FERC") implementing regulations.[4] DEC/DEP Witnesses Kendal

[4] Order No. 2016-349, Docket No. 1995-1192-E (May 12, 2016).

Bowman and Glen Snider discuss PURPA and FERC's implementing regulations in greater detail in their testimonies, but in summary, the Companies are required under PURPA and FERC regulations to purchase QF output at rates that do not exceed DEC's or DEP's avoided cost, are not discriminatory to QFs, and are just and reasonable to the utility's customers. The Commission more recently approved the Companies' methodology for calculating avoided energy and capacity cost rates and clarified that the Companies should regularly update inputs for avoided energy and capacity when calculating rates available to large QFs.[5] The Commission also accepted the Companies' payment for capacity based on the first year of need as identified in their most recent IRPs. As also addressed in further detail by Witness Snider, the Companies' normal process for calculating rates for large QFs is to use the most current inputs and assumptions of avoided capacity and energy needs to calculate avoided costs as of the time the QF offers to sell power to DEC or DEP.

The Companies followed this established process for each of the rates provided to Cherokee by utilizing updated inputs in each instance, as identified in my Figure 1. For example, in the case of the two most recent dispatchable PPA rates, inputs utilized for those calculations were based on the SC Purchase Power Schedule for Large QF Tariff updates for June and October 2020, respectively. Each rate provided also reflected the first year of capacity need as identified in the Companies' most recent IRP on file with the Commission. Each rate was therefore accurate and appropriate and calculated in a manner fundamentally consistent with

[5] Order No. 2019-818(A) at 29-31, 55-92, Docket Nos. 2019-185-E, 2019-186-E (Jan. 2, 2020); Order No. 2020-315(A) at 19, Docket Nos. 2019-185-E, 2019-186-E (Apr. 17, 2020).

that approved by the Commission and used by the Companies in calculating rates for large QFs.

Q. YOU INDICATE IN FIGURE 1 THAT THE 2018/2019 AND JUNE 2020 RATES PROVIDED TO CHEROKEE WERE CALCULATED FOR NON-DISPATCHABLE PPA PROPOSALS AND THAT THE SEPTEMBER 2020 AND FEBRUARY 2021 RATES WERE CALCULATED TO USE WITH DISPATCHABLE TOLLING AGREEMENTS. HOW DOES A DISPATCHABLE TOLLING AGREEMENT DIFFER FROM A NON-DISPATCHABLE "MUST TAKE" CONTRACT?

A. Under a non-dispatchable "must take" PPA structure, Cherokee would receive fixed on- and off-peak rates for energy and capacity, and those rates would be applied to the actual delivery of energy. The on- and off-peak rates should encourage Cherokee to operate when it has the most value to DEC. Cherokee would decide when to operate its facility, and would acquire its own fuel, and bear all costs associated with operation of the facility.

Under a dispatchable-tolling PPA structure, DEC would determine when to dispatch Cherokee, and would be responsible for acquiring and paying for natural gas to support operation of the facility. When the plant is dispatched, DEC would pay Cherokee for variable operations and maintenance and start costs. DEC would pay a fixed capacity fee regardless of the degree to which the Cherokee plant is dispatched.

Q. DID THE CALCULATION OF THE RATES FOR THE DISPATCHABLE TOLLING PPA DIFFER FROM THE CALCULATION OF THE RATES APPLICABLE TO A NON-DISPATCHABLE PPA?

A. Yes, but only in that the inputs to the rates reflect the specific characteristics of the Cherokee facility itself, rather than a general QF profile. However, the methodology for calculating rates under the dispatchable PPA still relies on the most current inputs and assumptions of avoided capacity and energy needs at the time a QF offers to sell, consistent with the Commission's directives and the Companies' normal practice.

Q. DOES THE FACT THAT THE COMPANIES PROVIDED RATES REFLECTING A DISPATCHABLE TOLLING PPA IN SEPTEMBER 2020 AND FEBRUARY 2021 IMPACT YOUR ASSESSMENT OF THE ACCURACY AND APPROPRIATENESS OF THE EARLIER RATES?

A. No. While the structure of the dispatchable tolling rates differed from the non-dispatchable must-take rate structure provided earlier, that does not impact the accuracy or appropriateness of any of the rates provided to Cherokee. In each instance, the avoided cost rates provided to Cherokee were calculated in a manner that was fundamentally consistent with the Companies' standard and accepted methodology for developing avoided cost rates for large QFs, by using the most current inputs and assumptions at the time.

Q. DOES THE FACT THAT AVOIDED COSTS HAVE DECLINED SINCE 2012 IMPACT YOUR ASSESSMENT OF THE ACCURACY AND

APPROPRIATENESS OF ANY OF THE RATES PROVIDED TO CHEROKEE DURING 2018-2021?

A. No. Each of the rates provided to Cherokee reflected updated inputs and therefore accurately reflected the Companies' avoided costs at the time. Witness Snider addresses the reasons for the decline in avoided costs in his testimony.

Q. CHEROKEE CLAIMS THAT THE RATES IT WAS PROVIDED WERE DISCRIMINATORY. DO YOU AGREE?

A. No. As I have explained, the Companies' normal process for calculating rates for large QFs is to use the most current inputs and assumptions for determination of avoided capacity and energy costs at the time a QF offers to sell. In each instance with Cherokee, the Companies followed this process and developed rates for Cherokee based on a methodology that was consistent with that used for other large QFs. These rates were not discriminatory as Cherokee was treated like all other large QFs.

Q. WITNESS HANSON SUGGESTS THAT THE COMPANIES DID NOT PROVIDE SUFFICIENT INFORMATION SUPPORTING THE RATES PROVIDED. HOW DO YOU RESPOND?

A. The Companies provided similar levels of rate support to Cherokee as to other large QFs. Outside of a formal regulatory proceeding, our practice has generally been to respond to large QFs' questions verbally, and/or to provide examples and summary level numerical information. Our experience with this approach has generally been satisfactory. Our responses to Cherokee's discovery requests since the Complaint was filed have involved providing very detailed input and output data related to modeling, and other supporting calculations.

This issue is also discussed by Witness Keen, and Witness Snider discusses the Companies' legal obligation under Act 62 and the Commission's orders to provide QFs "reasonably transparent" information regarding avoided costs.

III. RESPONSE TO WITNESS STRUNK'S AVOIDED COST RATE CALCULATION

Q. DID YOU REVIEW WITNESS STRUNK'S TESTIMONY AND HIS SUPPORTING APPENDIX PRESENTING HIS RATE METHODOLOGY?

A. Yes.

Q. WHAT ASPECT OF WITNESS STRUNK'S TESTIMONY AND APPENDIX ARE YOU ADDRESSING?

A. My testimony addresses Witness Strunk's calculation of a $110/kW-year payment to Cherokee.

Q. WHAT IS YOUR UNDERSTANDING OF THE CALCULATION WITNESS STRUNK MADE IN HIS TESTIMONY AND APPENDIX?

A. Witness Strunk attempted to convert the fixed dollars per MWh energy pricing included in the rates DEC provided to Cherokee on October 31, 2018 into a payment structure comparable to the 2012 dispatchable tolling PPA under which Cherokee currently operates (the "2012 PPA") pursuant to the Commission's extensions of that agreement. Based on this approach he calculated a $63/kW-year avoided energy rate and a $47/kW-year avoided capacity rate, and then summed those calculations to arrive at a total avoided cost rate of $110/kW-year.

Q. DO YOU AGREE WITH WITNESS STRUNK'S CALCULATION OF A $110/KW-YEAR AVOIDED COST PAYMENT FOR CHEROKEE OR WITH HIS PROPOSED AVOIDED ENERGY AND CAPACITY COST RATES INDIVIDUALLY?

A. No. Witness Strunk's rate calculations are inappropriate for several reasons and exceed DEC's avoided cost, even if the Commission were to assume that Cherokee established a LEO in September 2018.

Q. PLEASE EXPLAIN.

A. Witness Strunk's calculations greatly over-simplify the determination of an avoided cost rate. He did not have the benefit of running a production cost model, and he admits that the calculation he used was a simplified one, which he characterized as providing an "order of magnitude"[6] estimate of avoided costs applicable to a dispatchable PPA for Cherokee. He also acknowledged that the calculating of a $/kW-year payment rate for a Cherokee PPA is "quite detailed."[7] Therefore, Witness Strunk's calculation should not be relied on as an accurate representation of DEC's avoided cost since it falls far short of the methodology that has been established before this Commission, as detailed in the testimonies of Witnesses Bowman and Snider.

Q. CAN YOU ADDRESS IN FURTHER DETAIL THE FLAWS IN WITNESS STRUNK'S CALCULATION OF THE AVOIDED ENERGY COST RATE?

A. Yes. It is important to understand the various energy-related costs that DEC incurs

[6] Strunk Direct at 13.

[7] *Id.* at 15, n. 7.

monthly under the 2012 PPA. DEC is responsible for acquiring and paying for the fuel necessary to support operation of the plant when it is dispatched by DEC. In addition, DEC pays Cherokee a start fee each time the plant is started, as well as a variable operations and maintenance or "O&M" fee based on the amount of energy generated each month. Witness Strunk calculated an avoided energy cost of $63/kW-year, which recognized that DEC would pay for fuel and variable O&M, but failed to recognize start cost payments that DEC also makes to Cherokee.[8] For the 2019 – 2020 period, DEC paid Cherokee an average of [BEGIN CONFIDENTIAL] [redacted] [END CONFIDENTIAL] annually for start costs. In terms of the current contract capacity of 86 MW,[9] this represents a start cost payment of approximately [BEGIN CONFIDENTIAL] [redacted] [END CONFIDENTIAL] which Witness Strunk should have subtracted from his $110/kW-year estimate.

Q. CAN YOU ADDRESS IN FURTHER DETAIL THE FLAWS IN WITNESS STRUNK'S CALCULATION OF THE AVOIDED CAPACITY COST RATE?

A. Yes. First, the capacity rates Witness Strunk proposed were based on DEC's capacity rates from the 2014 North Carolina avoided cost proceeding (Docket No. E-100, Sub 140). These rates were completely out of date with regard to avoided cost estimates during 2018, were only available to QFs 2 MW and smaller, and for

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[8] *See* Strunk Direct at 16, n. 8, where Witness Strunk states that he did not recognize start costs ("If the new PURPA contract were to provide for explicit payment of start costs or fixed operations and maintenance costs, the baseline capacity charge would be reduced accordingly.").

[9] While the gross capacity of the Cherokee facility is 98 MW, the capacity contracted under the 2012 PPA was 86 MW.

both reasons were inappropriate for use as a basis for representing an updated capacity value for Cherokee.

Second, Witness Strunk incorrectly assumed avoided capacity costs for all years of the PPA. As discussed further by Witness Snider, avoided capacity rates should only reflect the years of the contract in which the utility has an avoidable capacity need. Based on its 2018 IRP, DEC did not have an avoidable capacity need until 2028. As a result, even assuming that Cherokee established a LEO in September 2018 (which, as Witnesses Snider and Bowman explain, it did not), the appropriate rate to be calculated at that time should not account for avoided capacity costs until the year 2028. Using updated avoided capacity costs from September 2018, and recognizing avoided capacity costs starting in 2028 for a PPA covering the 2021-2030 time period, which is $32/kW-year lower than Witness Strunk's $47/kW-year estimate, results in an avoided capacity cost rate of $15/kW-year.

Q. WOULD YOU PLEASE SUMMARIZE THE OVERALL IMPACT OF THE FLAWS IN WITNESS STRUNK'S CALCULATION THAT YOU HAVE IDENTIFIED?

A. Yes. Reducing Witness Strunk's total avoided cost rate of $110/kW-year by [BEGIN CONFIDENTIAL] [redacted] [END CONFIDENTIAL] to account for costs DEC would incur for start cost related payments to Cherokee, and by $32/kW-year to account for the years of the contract in which DEC would have no avoidable capacity need, results in a total rate of [BEGIN CONFIDENTIAL] [redacted] [END CONFIDENTIAL]. However, even this adjusted rate would be inappropriate, because, first and as Witnesses Bowman and Snider discuss in further detail, DEC does not agree that Cherokee established a LEO in 2018, and therefore DEC also disagrees that Cherokee is entitled to 2018 avoided costs.

Second, as I have explained, Witness Strunk's calculation, even with the adjustments I describe here, does not meet an acceptable level of accuracy for estimation of avoided costs that he proposes to become the basis for a long-term contract with a very large QF.

Q. WHAT IS THE MOST ACCURATE AND APPROPRIATE RATE FOR CHEROKEE?

A. Each of the avoided cost rates that the Companies have developed for Cherokee over the last three years was calculated based on inputs as of that time, consistent with how the Companies calculate rates for other large QFs, and therefore reflected each company's actual avoided cost at that time. Each of those rates was therefore accurate and appropriate at the time they were calculated. As stated by Witness Keen, currently, the most accurate and appropriate rates for Cherokee are the rates provided in February 2021, because those rates reflected DEC's avoided cost at the time of the original expiration of the 2012 PPA.

Q. PLEASE EXPLAIN FURTHER HOW THE RATES PROVIDED IN FEBRUARY 2021 REFLECTED DEC'S AVOIDED COSTS AT THE TIME OF THE ORIGINAL EXPIRATION OF THE 2012 PPA.

A. These rates were calculated using updated inputs and assumptions regarding DEC's avoided costs at that time, as indicated in my Figure 1. For example, avoided capacity costs were calculated assuming a 2026 first year of capacity need for DEC, as identified in DEC's 2020 IRP. The avoided energy costs were determined using the same methodology used for other large QFs, using inputs for those calculations based on the SC Purchase Power Schedule for Large QF Tariff update effective in October 2020, but also reflecting the specific characteristics of the Cherokee facility, including its dispatchability. The resulting total avoided cost rate was [BEGIN CONFIDENTIAL] [redacted] [END CONFIDENTIAL], which is approximately [BEGIN CONFIDENTIAL] [redacted] END CONFIDENTIAL] the rate that Witness Strunk proposed, and much more in line with the total rate of [BEGIN CONFIDENTIAL] [redacted] [END CONFIDENTIAL] that I derived by adjusting his rate to account for the flaws in his calculation as discussed above.

IV. <u>CONCLUSION</u>

Q. IN YOUR OPINION HAVE THE COMPANIES FOLLOWED A REASONABLE AND CONSISTENT METHODOLOGY IN CALCULATING AVOIDED COST RATES FOR CHEROKEE OVER THE 2018-2021 TIME FRAME?

A. Yes. All of the rates provided by DEC and DEP to Cherokee during this time frame were consistent with the methodology approved by the Commission for calculating avoided cost rates for large QFs. In contrast, the rate proposed by Cherokee Witness Strunk was derived in a manner that lacks the accuracy appropriate for establishing an avoided cost-based contract price, is based on outdated information, and significantly exceeds DEC's avoided costs at any point in time during the negotiations.

Q. WERE THE RATES PROVIDED TO CHEROKEE DISCRIMINATORY?

A. No. The rates provided to Cherokee were calculated using a methodology that was consistent with that used to calculate rates provided to all other large QFs.

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes.